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<i>Scapharca transversa.</i>	
<i>Arca pexata.</i>	Common.
<i>Arca transversa.</i>	
<i>Mytilus edulis.</i>	Abundant.
<i>Modiola plicatula.</i>	Exceedingly abundant.
<i>Pecten irradians.</i>	Common.
<i>Anomia glabra.</i>	Abundant.
<i>Ostrea virginiana.</i>	Exceedingly abundant.
<i>Teredo navalis.</i>	

Of Crustacea the following were observed :

Callinectes hastatus.
Platyonichus ocellatus.
Cancer irroratus.
Ocypoda arenaria.
Gelasimus pugnax.
Gelasimus pugilator.
Libinia canaliculata.
Panopeus Sayi.
Pinnotheres ostreum.
Eupagurus pollicaris.
Eupagurus longicarpus.
Hippa talpoidea.
Gebia affinis.
Palaemonetes vulgaris.
Orchestia palustris.
Orchestia agilis.
Talorchestia longirostris.
Talorchestia macrophthalma.
Gammarus ornatus.
Unciola irrorata.
Caprella geometrica.
Erichsonia attenuata.
Cirolana concharum.
Bopyrus palaemoneticola.
Livonica ovalis.
Lepas fascicularis.
Lepas anatifera.
Limulus polyphemus.

The Turret Spider on Coffin's Beach.—Dr. HENRY C. MCCOOK remarked that he had spent July and August, 1888, at Annisquam, Mass., a port of Cape Ann at the mouth of the Squam river where it enters into Ipswich Bay. The eastern shore of the bay opposite Annisquam consists in part of a stretch of sand hills, known as Coffin's beach. The sand is of a beautiful white color and is massed at places in elevations of considerable height, constituting what is known as the "sand hill," or "the dunes." The fragrant bay bush grows in clumps along the edges and summits of these irregular sand elevations, and this is intermingled with patches of tough grass.

At his first visit to this beach he discovered several burrows of *Lycosa arenicola* Scudder,¹ popularly known as the Turret spider.² Subsequently he explored the field and found numbers of these Lycosids domiciled in the sand and spread very generally over the dunes. They came down very close to the high water mark. Thirteen burrows were found quite near together, seven in a circle of six feet in diameter. Most of these burrows were about half an inch in diameter. Two were located within twelve inches, and several others within two feet of the edge of the sandy ridge which marks the point of highest tide. The tubes vary in size and depth. Some are scarcely larger than a quill, some, indeed, not much larger than a good big darning needle. These were occupied by young spiders. The adult spiders occupy burrows in the sand about twelve inches or less in depth; the younglings make holes four inches deep or less.

In digging for spiders Dr McCook began to remove the sand ten inches or more from the opening of the burrow. Thus the dry sand immediately surrounding dropped away into the excavation, leaving the silken tube which lined the burrow adhering to the grass stalk or twig which he had inserted within it. The burrows proved to be silk-lined for a space of from four to seven inches, the lining however, being of a very thin texture, not like the tough silken tube with which the Trap-door spider lines her nest, or which the Purseweb spider erects along the trunks of trees. Below that point the burrow enters into the sand unlined. The top of the sand is quite dry, but the bottom part, wherein the lower portions of the burrows are made, was invariably found to be damp, and of course closely packed, so that it was not very liable to fall into the excavation. A little circular ridge of sand ordinarily surrounds the opening of the burrow, but he saw in no instance anything like the tower of straws and sticks which this spider builds in the meadows and fields of New Jersey, Pennsylvania and other points where it has been observed. The drifting of the sand before the wind seemed to have little or no effect upon the burrows which were always found quite open and free around the mouth. Heavy rains which fell during the season had no appreciable effect upon the burrows or their inmates although the tubes must often have been filled with water.

The spiders captured were all of a light hue as compared with the same specimens found in our vicinity. Specimens almost identical with these were found by Dr. Joseph Leidy in the sand at Beach Haven, New Jersey; and this pale coloring appears in all other littoral specimens examined. The influence of environment, manifest in the lighter coloring of this spider, was also seen in a grasshopper or locust which is quite abundant on Coffin's beach. It is almost as white as

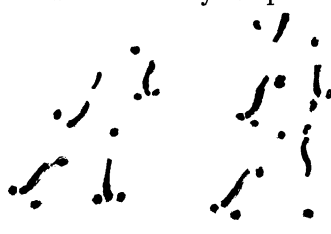
¹ Psyche, vol. II, p. 2, 1877.

² Emerton ("New England Spiders of the Family Lycosidæ" Trans. Conn. Acad. vol. vi, 1885) describes the species as *Lycosa nidifex* Marx, for what reason he does not state. Scudder made the spider known in 1877; Dr. Marx gave his description in the "American Naturalist" May 1881. The priority is undoubtedly with Scudder's name.

the sand over which it was found hopping. These grasshoppers probably furnish food for the spiders, but the only remains of animal food found within the burrows were those of a large brownish beetle, several specimens of which were picked up on the beach.

Among the other denizens of the beach are ants of a small species whose nests are well nigh numberless. They are made in the sand, but it seemed that the little creatures must have considerable difficulty in preserving their galleries and rooms from continual destruction by the caving in of the incoherent particles. However, they do manage it, although in digging to find the character of their galleries the speaker could not so manipulate the sand as to prevent it from tumbling into the formicaries and thus hindering him from studying of the interior. He did not know what the ants feed upon, although he found some of them engaged at the carcass of one of the brown beetles above alluded to, and no doubt the flotsam of the sea thrown upon the beach affords them abundant material for food. He made a number of visits to these sand dunes both by day and night, prolonging his stay to a late hour in the evening in order to discover something of the outdoor habits of the colony of Turret spiders, but succeeded in learning very little that is new.

A lady artist who with some companions was sketching upon the beach, (for Annisquam is a favorite field for painters,) informed Dr. McCook that about dusk a large spider was seen moving over the sand towards the water. Supposing this to be one of the above colony the question at once arose, do they come down from the dunes to the wide flat stretch of beach, that is covered at flood and that is uncovered at ebbtide, in order to prey upon the sea life that may be left at the retiring of the waters? Two afternoons and nights were spent from five until nine and ten P. M. endeavoring to solve this problem, but without any results. He then tried another method. Visiting the beach in day-time he captured a couple of mature spiders; placed them upon a smooth stretch of clean sand and permitted them, and when necessary compelled them by prodding, to move over the



surface. They left upon the sand a peculiar track which is here roughly represented by two sections taken from different parts of the trail. Having made a careful sketch of these foot prints he returned early next morning and made a careful examination of the beach for a considerable distance along the shore.

Many tracks of various kinds of creatures, including such insects as beetles and grasshoppers, and also of some small vertebrate animals, were found.

But by far the greatest number were tracks which corresponded precisely with those made on the previous day by the captured *Arenicolas*. Multitudes of these were seen upon the sand covering the surface and slopes of the hills and extending to the very border

of the surf line. They traversed the ground which had been covered by the tide, but which for a considerable distance is there exposed at the ebb. These foot-prints could be traced everywhere as issuing from and returning to the burrows which he had marked by flagging the grass stalks in their neighborhood. It was thus demonstrated, in this indirect way, that the narrative of his artist friend was correct, and that the Turret spiders do issue from their burrows during the night and perhaps at other periods and traverse the sandy flats, no doubt in search of prey. One half grown spider was captured while wandering on the flat.

These spider tracks were in themselves an interesting study, and Dr. McCook expressed regret that he did not sketch a longer consecutive series. The motion of the feet was so rapid that he could not determine the order in which they were placed down, nor identify the mark made by any particular foot. The scratch in the figures he thought might have been made by the spinnerets at the apex of the abdomen trailing in the sand.

DR. CHARLES S. DOLLEY had observed similar tracks upon the sandy beach of Lake Ontario, near Rochester, which were made by the same spiders that dwell in that vicinity. He had found the spiders sheltered under the drift on the very edge of the shore whither they had doubtless gone in pursuit of prey or to drink.

Messrs Auguste Sallé of Paris, Louis Bedel of Paris and Dr. David Sharp of Wilmington, England were elected correspondents.

The following were ordered to be printed:—